Smart Water Meter Adapter

BEng (Hons) Electronic Engineering—2019/20

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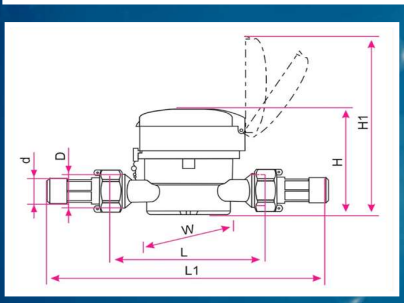
Background

- The UK is currently home to a population of 66 million. As this number continues to grow, so does the amount of clean water needed to sustain it.
- Subsequently, there are arising concerns that the UK will face serious water shortages in the next 25 years.
- Over 50% of UK homes use a water meter to monitor their water usage, but the cost of implementing a smart water meter is much more expensive.

Water Bottle in a Drought



Water Meter Technical Drawing

Problem

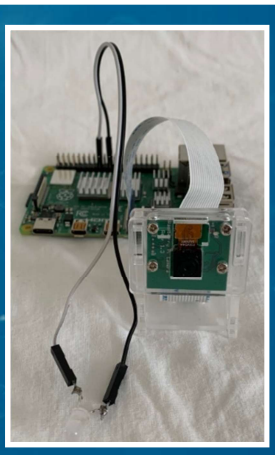
- The aim of this project is to create a smart water meter adapter that can interface with a water meter to track its readings and aid water conservation.
- This should provide the user with information about their water usage, letting them make informed decisions about how to save water in their household.
- A sustainable prototype and power solution concept need to be produced before being evaluated and tested against the specification.

Solution

The solution to this issue involves research, design, development, and implementation of a product that is sustainable and can be achieved at low costs. A solar panel was chosen to power the solution, while the prototype casing would be made from off the shelf components.

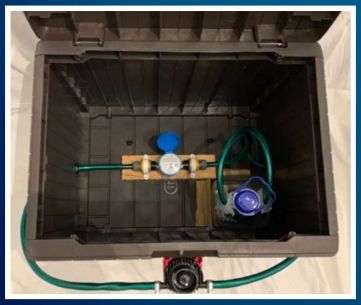
The internal hardware used to create the solution would be:

- Raspberry Pi 4B 4GB board (with the required power supply, HDMI output and 32GB SD card).
- 5MP camera and housing.
- A white LED and accompanying wires.
- A USB keyboard and mouse for command input.



Key Product Hardware

Product Attached to Water Meter



Prototype Test Environment

Results

- Detailed designs for internal and external hardware, along with solar power calculations created sustainably.
- Product produced for low cost, so could be commercially manufactured and applied to water meter for much less than the cost of a smart water meter.
- Successful testing of casing suitability and choice of hardware, but python program didn't achieve the desired results when run.

Ideas For The Future

- Revisit project with improved coding skills to achieve a fully functioning prototype.
- Allow output data to interface with existing smart meters to give users one display that provides all household utility bills and usage.

Smart Meter Display

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